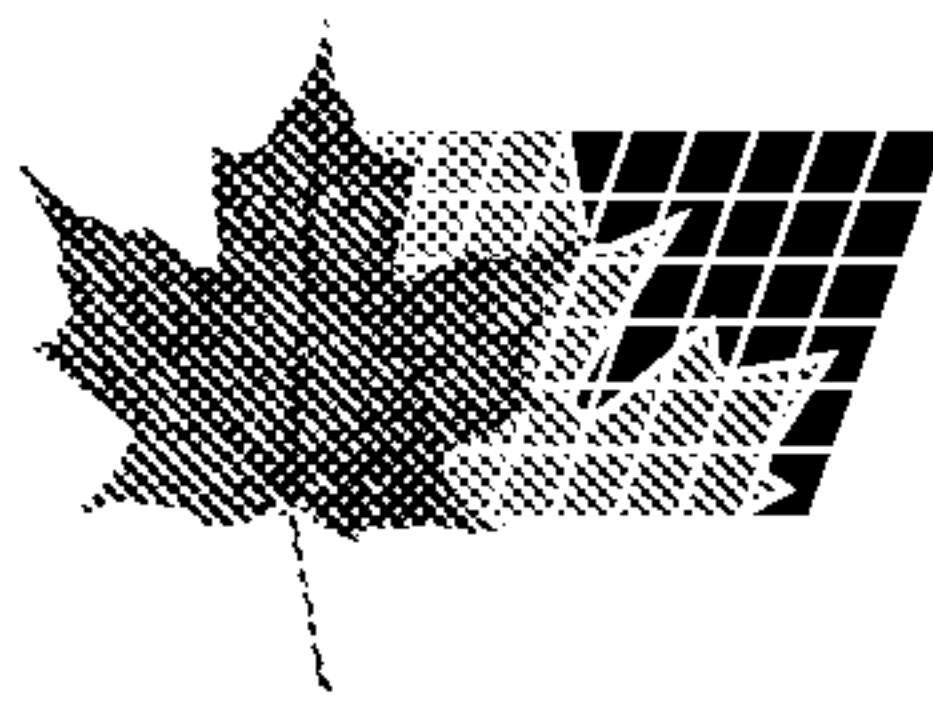




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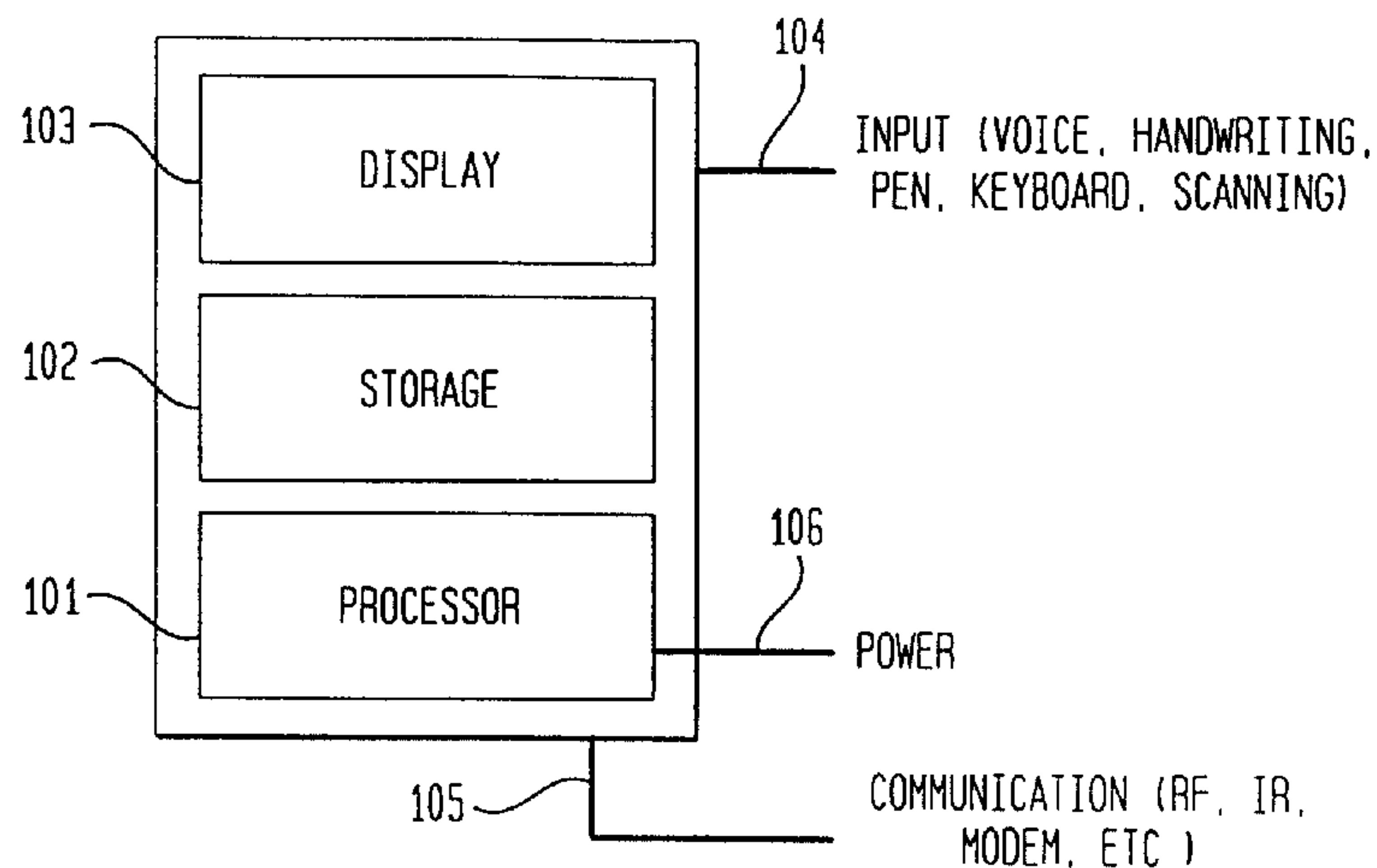
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(54) **METHODE DE FOURNITURE DE SERVICES AUX
UTILISATEURS DE DISPOSITIFS MOBILES**

(54) **A METHOD TO DELIVER SERVICES TO MOBILE USERS**



(57) Most online services are not geared to support disconnected mode of operation of a mobile device. This invention describes a method to make online services available to mobile users in disconnected mode by exchanging structured electronic messages. Such as a system can be used to build a custom service by combining service offerings from different service providers, and transmit the same to a personal agent an intermediary who would then provide the customized service.

A METHOD TO DELIVER SERVICES TO MOBILE USERS

ABSTRACT

Most online services are not geared to support disconnected mode of operation of a mobile device. This invention describes a method to make online services available to mobile users in disconnected mode by exchanging structured electronic messages. Such as a system can be used to build a custom service by combining service offerings from different service providers, and transmit the same to a personal agent an intermediary who would then provide the customized service.

A METHOD TO DELIVER SERVICES TO MOBILE USERS

FIELD OF THE INVENTION

5 The invention relates to the means of delivering online services to mobile users in a pervasive computing environment. In particular, an apparatus and a method for delivering information about services that can be used in disconnected mode to request specific services.

BACKGROUND

10 Pervasive computing environment generally involves using mobile devices such as portable computers, pagers, smart phones, personal digital assistants, set top boxes, etc., enabling access to data and services from anywhere at anytime. Mobile devices owe their popularity to their ability of functioning in disconnected mode, and to their small size permitting them to be carried anywhere on person. At present, one can download electronic content and browse it in disconnected mode. It
15 is even possible to fill any request forms and then connect to submit the completed forms for approval etc. Typically, end-user requirements demands services from more than one enterprise due to reasons including but not limited to, convenience and efficiency. At this point there is no alternative to micro managing interactions with individual enterprises.

 It is, however, desirable to have the following system and a method to enable a end-user to
20 custom build a virtual enterprise per request basis from existing service providers. This need and its benefits are illustrated by the following example. For instance, let's assume the existence of following unrelated enterprises: an information research company KnowledgeStore, a copy and printing services company SuperPrint, and a delivery service OminiDelivery. Further more assume that the above companies offer their services online, and make their menu of services and associated
25 forms in a format suitable for disconnected operation as mentioned earlier. Now the end user builds a custom virtual enterprise that does the following: 1) collect a research report XYZ from KnowledgeStore, 2) print it in both hard-copy format, and 35-mm slides at SuperPrint, and 3) deliver them the next day before 10 AM.

SUMMARY OF THE INVENTION

Central to the invention is the concept of electronic envelope (eEnvelope), wherein a structured electronic message is exchanged among entities in a virtual enterprise, similar to the one discussed above. At a minimum, eEnvelope comprises of the following elements: 1) address of sender (electronic or otherwise),
 5 2) address of recipient (electronic or otherwise), and 3) content message. The content message may further include other eEnvelopes.

In terms of the above example, the menu of services/products offered by the KnowledgeStore, the SuperPrint, and the OminiDelivery are available to the mobile user in the form of eEnvelopes. The eEnvelopes could be sent to the user unsolicited as a part of promotional offer, or downloaded by the user
 10 as needed. On the mobile device a computer program interprets the electronic message and displays its content to the mobile user both in connected or disconnected mode. For example, in the case of the KnowledgeStore the user is shown the types research reports, and a brief description of each of them. At the end of selection process a eEnvelope, EV1 comprising of details regarding the report selected, is prepared. The eEnvelopes EV2, and EV3 are similarly prepared, and contain the print options, and the delivery
 15 instructions respectively.

In addition EV1 should contain instructions to authorize the SuperPrint to obtain the document for printing, and EV2 should contain the credentials to authenticate itself to the KnowledgeStore. The exact content and format of the authorization, and authentication instructions depend on the protocol used. In the same manner, EV2 and EV3 should also have authorization and authentication instructions.

Now, the virtual enterprise comprising of the KnowledgeStore, the SuperPrint, and the OminiDelivery to service this specific request is setup as follows. A eEnvelope EV4 is prepared for this purpose. Among other things, it includes eEnvelopes EV1, EV2, and EV3, and instructions to and address of a personal enterprise agent (PEA), a computer program, on a remote server. In essence the mobile user is contracting out the administrative and coordination responsibilities of the virtual enterprise to a PEA. In
 20 not so distant future it is possible receive bids form multitude of virtual enterprise agents and choose one.
 25

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 Shows a basic mobile device

Fig. 2 Shows a block diagram of a simple computer network

Fig. 3 Shows a block diagram of a mobile application

DETAILED DESCRIPTION

As shown in Figure 1, a mobile computer is made up of the following hardware components: processor 110, storage 120, display 130, any data input mechanism such as voice, handwriting, pen, keyboard, and others 140, any communication mechanism such as wired or cellular modem,
5 infrared, and others 150. In addition to a power supply 160.

Figure 2, describes a plurality of mobile computers 210, a connection of the mobile computer to a network 220, a computer network 230, and plurality of resources residing on servers 240.

As proposed a typical mobile application 300 consists of three modules: 1) a user interface (UI) 310 module, 2) a message formatter (MF) 320 module, and 3) a message communicator (MC)
10 module. The UI is used to gather input from the user and to display output messages to the user. The MF formats user input into messages suitable for transmission over communication medium, and translates messages received from communication medium into a format suitable for user presentation. The MC is responsible for sending and receiving messages over the network.

CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

- 1 1. A computer-implemented method for building custom service from services offered by individual
2 service providers comprising of the following steps:
 - 3 selecting required services;
 - 4 preparing a request eEnvelope comprising of service requests for each individual service
5 provider;
 - 6 building a virtual enterprise eEnvelope from request eEnvelopes;
 - 7 transmitting virtual enterprise eEnvelope to personal enterprise agent for execution;
 - 8 interpreting the eEnvelopes sent by individual service providers;
 - 9 displaying eEnvelope.
- 1 2. A structured electronic message called eEnvelope comprising of the following elements:
 - 2 electronic address of sender;
 - 3 electronic address of recipient;
 - 4 interpretable electronic message.

FIG. 1

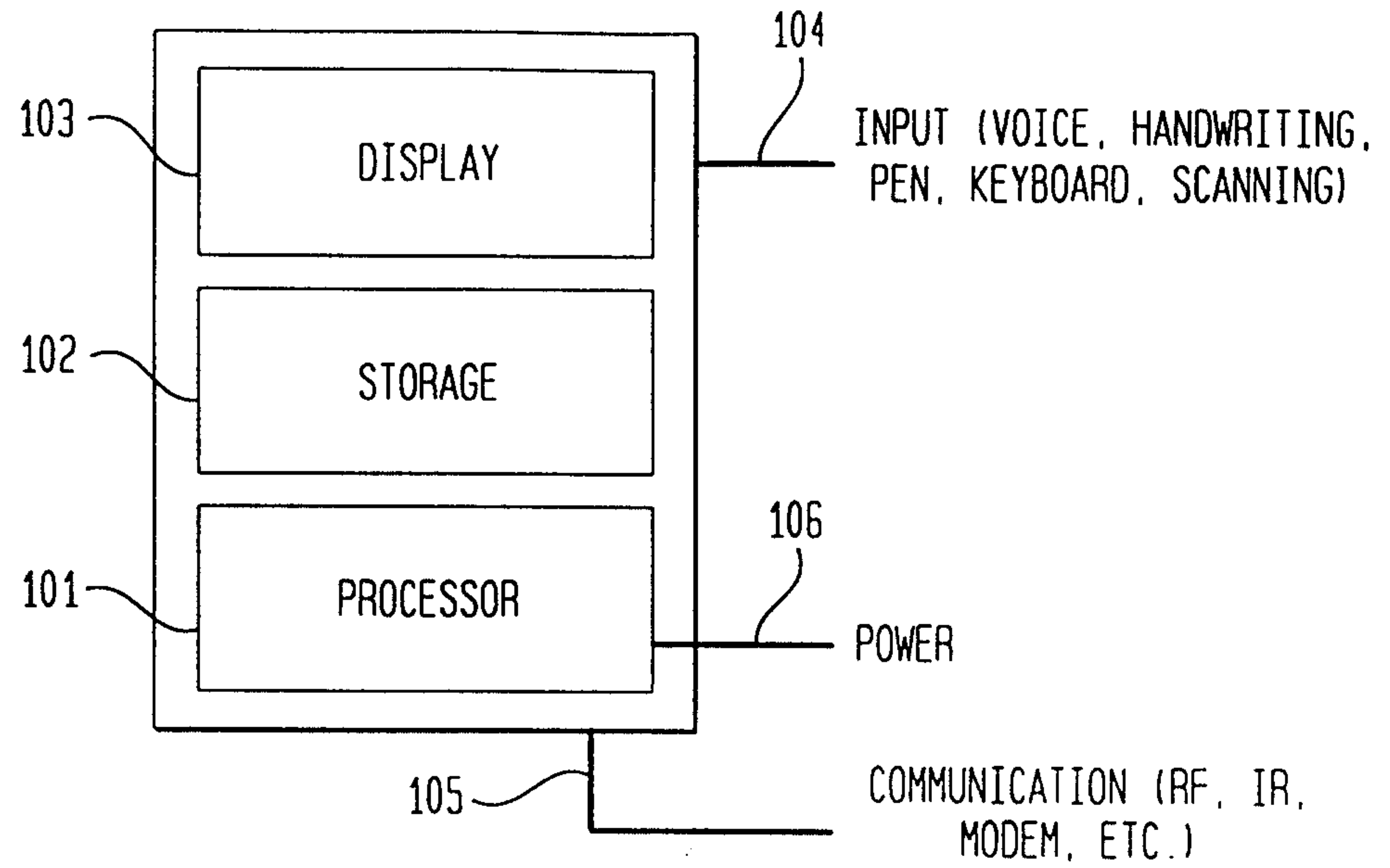


FIG. 2

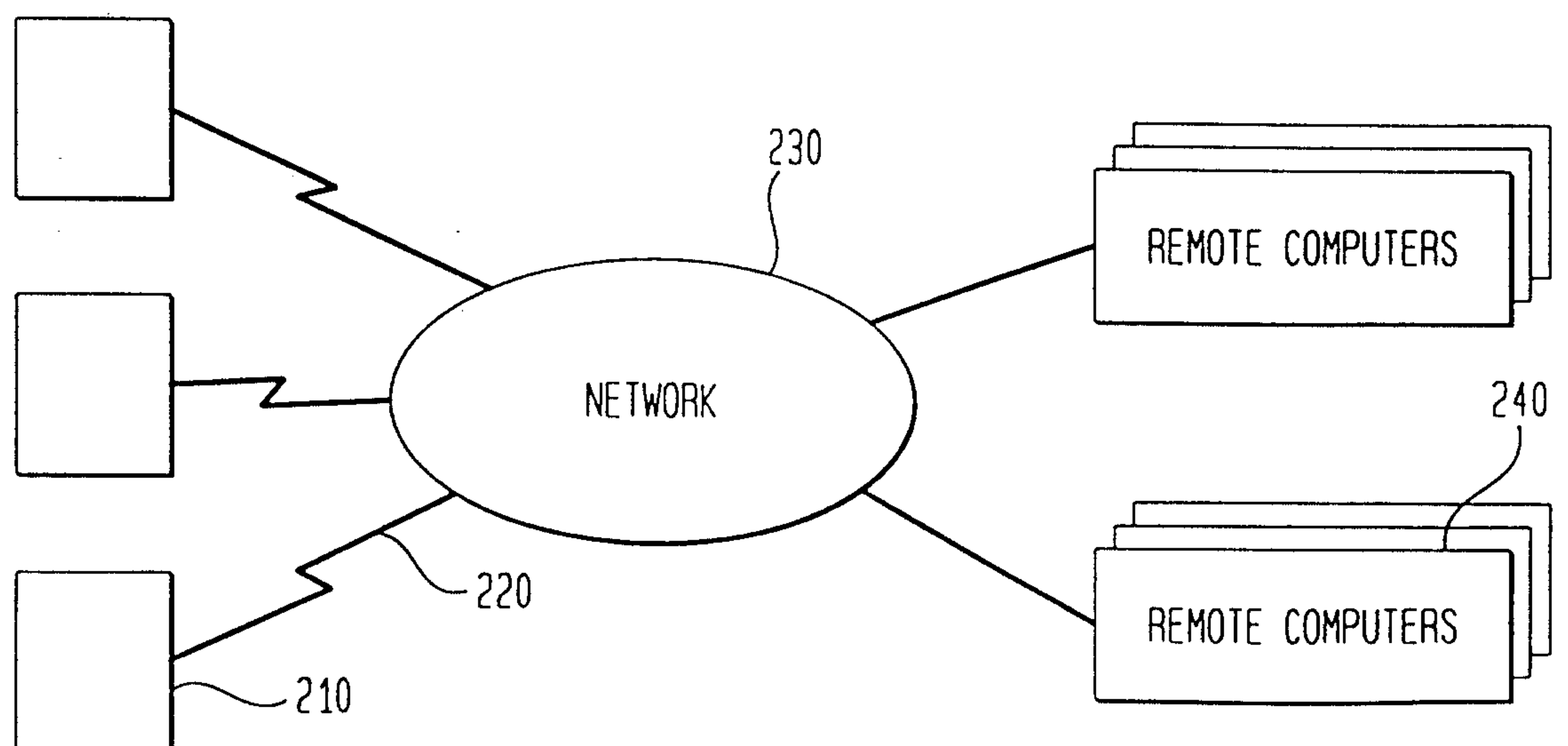


FIG. 3

